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### THE TRIBUNE.

### Dr Lardner's First Lecture.

Second Series

Ladies and Gentlemen: The manner in which I propose to bring to your attention the subjects on for these lectures is that which I have unicoverers themselves have produced their great results; and there is no way in which sciensas, though, truth to say, they were acquired pour to be but the cropping out of science—to hope way up through the surface, and introduction.

Elaborate and careful investigations has brought to light certain physical facts of an extraordinary nature concerning Electricity. It has been found that all bodies in their natural state, that state in which we commonly see them, are pervaded through their inmost dimensions by two extremely subtle fluids called by the common name of Electricitybut differing in certain respects. Philosophers generally agree to call them positive and negative Flooricities. How these two extremely attenuated been able to detect in them the quality of gravita-tion pervade all substances. When bodies are in law which they established was the division of botheir natural state these two fluids are contained in equal proportions; any body-a table, chair, &c. contains an equal quantity of the positive and negative electricities. These two fluids have a procicle of the one conlessing with each particle of the the mouth of the class tabs they were using: other, so us to satisfy their reciprocal forces-the body containing an equal quantity of these is in a which had not been rubbed as well as by the giasof these two flaids and separates the one from the | tain whether a longer cork would exhibit the sai ther, then their mutual attractive force is no longer tisfied and the fluid becomes an active agent. the other. The body is in common language then suid to be electrified. I have thus briefly given on the ultimate conclusions which have been eached concerning this agent, and you can put ourselves in the situation of philosophers with regard to it, since you possess all the knowledge conerning it that has yet been unfolded.

There are various ways in which a body may be lectrified-in which the natural combination of the fluids may be destroyed. One of the most com-If two substances, as two caves of paper, or glass and silk, be rubbed togemposes the combination of the two flu-

over others; for example, the metals transmit heat freely, while glass conducts it not at all. One of the first things to be known is the class of substan (e) most ca a le of conducting electricity, and that ciass which does not do it ail, or at least but imperfectly. The bodies along which it moves with most facility are the metals-all of them, without exception. If you put an electrified body at one end of a metallic rod, the fluid will rush to the other with minute rapidity, and will be stopped in us career only by meeting same nonconduc-The bodies which refuse to conduct the fluid can hard vibe designated by any general appellation; may be said that norous bodies, such as wood, fenthers, &c., are non-conductors. libres of wood are bad conductors, while wood itself may be a good one; but in this case the fluid is carried along by the moisture in its pores. Liquids, although conductors, are not very good ones the reason of this? said they; "when we suspend not equal by any means to the metals. To this distinction of bodies into conductors and non-conductors I shall have occasion frequently to refer, and it may be necessary to say that no bodies are these two substances. They followed this point, and absolute and perfect in this respect. The conduct- aw plainly enough that the electricity escaped ing power is to Electricity what transparency is to light. Glass is a conductor of light, although im- result of this was the grand discovery-a discovperfect, while wood is a non-conductor.

I have mentiosed, then, two main facts; that all

bodies naturally base two electric fluids in a state of combination, and that being electrified consists in disturbing this equilibrium; and that there are ery in Electricity, and you see the accident from two classes of bodies, one capable of conducting which it arose. must notice before proceeding to trace the progress of discoveries in Electricity, is this. I have stated that attrition decomposes the combined electricity is thus. They are effect may be produced by a change of temperature and in various other ways but by one in particular, which merits notice. It a body in its natural state—say a lump of metalbe brought near an electrified body, the proximity of the latter will decompose the electricities of the latter will decompose the experiment of the latter will decompose the electricities of the latter will decompose the electricities of the loss of heat was repeated until B was succharged; while A latter must be remembered, were produced by any at all the mighty effects experienced by was repeated until B was succharged; while A latter must be remembered, while A latter must be remembered, was repeated until B was succharged; while A latter must be remembered, was repeated until B was succharged; while A latter must be remembered, was repeated until B was succharged; while A latter must be remembered, was repeated until B was succharged; while A latter must be remembered, was repeated until B was succharged; while A latter must be remembered, was the latter in mist have must be rememb of the latter will decompose the electricities of the former. Suppose the body be electrified positively; the attraction of the positive electricity will draw the negative of the body in its natural state toward the side nearest itself, and repel the posttive to the opposite extremity. By this attraction of one and repulsion of the other, the electricities of the bodies are decomposed. This I can only notice briefly now; it will be seen more clearly in unfolding the progress of discovery.

These are the main points to be impressed upon

your minds at the outset.

The subject of electricity is one, the merit whose discovery belongs almost exclusively to modern times. It is a lesson-a moral lesson o great importance, deduced from the progress

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ture prompts to discovery, and notice the slowness | there is a continual tendency in the fluid to escape, | in my swn time public opinion was divided. But | severe a shock—which was not the case. It was

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on arose from a principle similar to that obhave developed. It may be done in a brief compass, though, truth to say, they were acquired bitions of the electric influence. These facts are her precises ares upon the notice of man. We next find it on record that a certain Gothic chief tain, on drawing off his clothes, perceived his flesh to be on fire. We know now that the attrition of cloths upon untural bodies developes electrical

indications which might have afforded trases for discoveries in Electricity, but which were utterly unheeded. It was not till about a hundred years ago that facts so accumulated upon the attention as to asquire a certain general character and lead to the principles of Electricity. The experiments of two individuals in England, GRAY and WHEELER, fluids, so attenuated that no means have ever yet afforded the first set attic information possessed dies into conductors and non-conductors. Up to their time the reals facts known were, that if corall substances be rubbed with cloths they became electrified and would attract feathers, and show in repenting and o serving their experiments, hap pened or one occasion to thoust a piece of cork into apound being found to produce no effect. A infinite surprise that they were at racted by the cork But if any external which had. With the spirit of philosophers the ause disturbs this equilibrium, breaks the union determined to carry the matter further, and usees property; they tried it and found that it did. They to the cork, and en rubbing the glass they found that the rod shared in the electrical power. They at once concluded that here was at work some in fluence before unnoticed, and determined to pursu the experiment until they could reach a more gen-

They procured a bempen cord as a substitute for suspended at its other extremity an ivory ball. may along the cord; and upon holding light sub stances to the ivory ball, truly enough it attracted them just as the red had done. This was a most impo tant step. It was clear the fluid passed along the cord, and they resolved to carry their experi-The positive withdraws from the negative, ments still farther. They accordingly retired to a lin took it in band in June, 1747; and with ached to the handkerchief, while the country house, owned by Wheeler, and some miles that singular arder of mind, that extraordinary need is attached to the manufacture. The disturbance insolve adheres to the glass. The disturbance inthe from London, where they could have more local zeal and enthusiasm of character which market
the whole life of Franklin, and which made
the conveniences for their investigations; and proceedthe whole life of Franklin, and which made Granting this fact, you may ask ed thus: Not finding a sufficient high; from which why is this effect produced? What is there in the to suspend their cord, they had recourse to this exharacter or nature of silk or glass which should pedient-which affords another forcible illustration as much about it as the most profound phi-discovery of truth. We shall indeed find, if we her. Nothing more than the maked fact is watch the progress of physical science, that a known, and no principle of science has been disco-vered which will explain it. The only difference owed their discovery solely to accident, and thus ween philosophers and yourselves is, that they | shall we find it with this great principle of conduction. Gray and Whoeler suspended their hempen cord; but as they wished to make it longer than

along the wire, but would not along the silk. ery of the first order in physics-that the metals are good conductors, while silk, and then all abrous bodies, will not transmit the fluid at all or This was the first great discov

nake led to results of far greater importance. The first was the capital fact that there are two kinds of Electricity; this Dufaye clearly showed if you rith a piece of sealing wax and hold it to a light body it will attract it, white glass being ubbed repels it. Both were electrified, and Gray and Wheeler supposed that both were electrified in he same way. Duraye believed that the electricity ies were possessed of opposite propersies. The body attracted by the sening wax was repelled by the class; while the scaling wax and the glass at racted each other. This was the first grand dis

snowledge, to observe the manner in which Na-

of man in following out her suggestions. There is and it will be entirely lost if any body standing according of modern times of which the upon the floor be placed in contact with the electron of modern times of which the upon the floor be placed in contact with the electron of modern times of which the upon the floor be placed in contact with the electron of modern times of which the upon the floor be placed in contact with the electron of mathematics, so it has been within the last 20 years, by processes I need not now expenditure to the inner surface and his experiment. many, many an age backward; and we may thus into the hands of the electrician a vast and extra-learn how truth, which appears in the end so clear ordinary power—the power of arresting the fluid—for which it would not suffice; but which could step farther and ascertained that the form of the and beautiful, lies for a long while buried and concealed.

At an early period in the history of physical science, the property possessed by Amber had been observed. Amber was a substance remarked by the done? By the ancients from the property for the property possessed by I and I are the power of arresting the mid
and compelling its presence—of keeping it under the closest ex
and compelling its presence—of keeping it under the closest ex
which are often called the trireous and regiments are often and regiments. This is the power of insulation. Sup
property possessed by Amber had been observed. Amber was a substance remarked by the property possessed by I and the property possessed by the ancients from this circumstance—that when subbed it had the power of attracting light substances. This mysterious power appeared to them suspended by a silk thread or placed upon this and said. Now Delaye at once seized upon this and said. Now that Amber had a soul. This was the extent to compelling the submit to the that they were accustomed to say that Amber had a soul. This was the extent to compelling the submit to the theory of Frankin, who remains the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and only of the instance of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and only of the instance of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and only of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and only of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and of the first minds of the day. So difficult was it to find this single grain of trul. These Experiments at Leyden soon reached Landau and of the first minds of the day. So difficult was it to find this single grain of trul. teaching. There is nothing which in itself is more interesting than the habit of following the steps by which discoverers themselves have produced their which discoverers themselves have produced their which discoverers themselves have produced their controlled to the principle had been to be a soull be submit to the severest cross-examination. Dufuye reasoned farther: we know that the produced their communicated to Frankin, who repeated them and endeavored to explain the results beauty and ingeneration to the severest cross-examination. Dufuye reasoned farther: we know that the produced their communicated to Frankin, who repeated the produced their communicated to Frankin, who repeated the severest cross-examination. The produced their communicated to Frankin, who repeated the produced their communicated to Frankin, who repeated the severest cross-examination. The produced their communicated to Frankin, who repeated the produced their communication of the produced the produced their communication of the produced the carried until an early period in the Christian era, if a body be electrified the electricity in escaping when we find indications of a slight advance. In will make itself visible by sparks. Now we know when we when we and indications of a significance from the conclusion of the sunthat the bodies of animals are capable of being that the by which it was originally acquired. I Roman sentinels who had seen, in southern lati
Roman sentinels who had seen who tudes, flames upon the points of their lances.— can manage to charge the person of a man and the most profound mathematical university in the Whether this is to be regarded as a fact in the his- prevent the fluid from escaping, we may draw a world; his associates were mathematicians and to remark as follows upon been made almost in our own tory of electricity may well be doubted. We now urse the discoverers them know, what was not then suspected, that this phesis to be regarded as a shell in the man tork of electricity may well be doubted. We now spark from him. With this plan in his head, Duke have went to the Abbe Noller and disclosed his their rivalry, and his mind urged to farther inquiry. The subject from Astronomy, Ladies and Gentletaye went to the Abbe Noillet and disclosed his the result of the state of the stat following out the discovery of Gray and Wassele Now, said D daye, 'I'll suspend my body by silk cords: it shall then be electrified, and you may try to obtain the spark. It was agreed, and Dutry to obtain the spark.' It was agreed, and Du-taye was duly hanged with silk. Electrical marubbed and as fast as electricity was evolved it When it was thought that the philosopher was sufficiently charged, Nollet presented his knuckle to his cheek, and behold a bright spark passed from one philosopher to the other! This to us is amusing, because with us at the presen

> ricity were gradually unfolded was from 1730 to is extremely slow, and in fourteen or fifteen years it has engaged in the propagation of scientific man who, without any extraordinary powers of and an ardent desire for its diffusion. The Secre Collinson, a name now almost unknown. this period also, that is, in 1745, Philadelphia pos sessed FRANKLIN, then unknown except at h me-laboring as a printer in that city. There was the delphia a Literary and Philosophical Sonety-either the same as that which now exists. the landable object of the Royal Society of London to call together scientific misds, and to promote communication between scientific bodies all over the world, and thus to aid in the developement of truth and of valuable facts in Science and th Arrs. When the circumstances I have recounted attracted general n tice, Collinson sent over to the Philosophical Society of Philadelphia one of the glass tubes used in electrical experiments, with written instructions as to the mode of using it. When it arrived, the few whose business altowed which then had scarcely been heard of in thi country, said to Franklin, 'Here is a letter from this gentleman with a glass tube; look at your zeal and enthusiasm of character which marked with him the taking up of any question and the pursuit of it to its extreme limits, one and the same thing, within a week he had repeated ad the experiments ever made upon the subject, and himself in a position to push his inquiries beyond the point the same subject had reached i

In October he commenced a correspondence was continued on all convenient occasions in a series of letters which, like other scientific writ-

Gray and Wheeler discovered that some bodies were conductors and others non-conductors. As immediate consequence of this, an important practical fact ensued. If a body be electrified,

three thousand miles first as a tallow-chandler's apprentice, then as a means confined to popular assembles, since at is a day, printer, the winder is not that he should have only ten or twelve years since the most remarkable. Now stamped with the highest, most far-seeing faculthes, and had it been cast in a University and subjected to its discipline, it is hard to say what limits would have placed a bar to his discoveries. His theory, now demolished, however, is but a small being in one of the two foci. The Earth pisses now demolished, however, is but a small part of his valuable contributions to the cause of frough that portion of its orbit which is neares

REGICE, with a friend named Cuneus, and a monk, Kueist, pursued their labors together on subjects re attracting so much attention, and in the course of their studies they fell upon a discover | thoroughly until about ten years since. ry of remarkable importance, and the circumstances attending it were of profound interest. The effect produced by the passage of a spark from an with the change of distance and that there is no electrified body was understood to be a pusgent, the produced if a stronger influence could be ob-tained; if a spark produced this result, what means free from it. Poisson said—true the Earth would be the effect of a powerten, twelve or twen- is nearer the Sun from. Autumn until Spring than ty times as great. But the question arose how to from Spring till Autumn; therefore in a given time But how should this be done! One of them said that water was a good recipient, and glass will Earth is nearest than when most distant from the guard it, because the fluid cannot pass through Sun, still the number of days is less; the quantic Now,' said they, 'why not pour water water? it must remain there—the water will be charged, and we will get a shock a nundred times as great as usual. This was all just and philosoas great as usual. This was all just and plantons phical, and on this reasoning they proceeded. The lar was partly filled with water; Muschenbroeck took it into his hands; a metallic wire was led down into the water, by which the electricity was compensate each other; and it is a mistaken nocommunicated to the fluid. Muschenbroeck, hold- cion that more heat is imparted to the earth in ing the jurin one hand after the water was charged, winter than in summer: the amount being just teached the metallic wire with the other. He reeived a shock from which he said he suffered more France he would not tepeat the experiment. He larly upon the surface at one season than at th

has a ly they became reasoured, and M. Ala and did nolds true of hear; and carrying it out with respect repeat it. His sufferings, in consequence, were quite equal to those of Musshenb eck: he declared north pole leans toward the Sun, and his beams he nose, and suffered in various other ways - obliquely Winckler was the next to try the experiment, and wish Colliss on, and between 1747 and 1752 this Madam. Winekler next attempted it, and was this subject. You would naturally suppose, from was continued on all convenient occasions in a secred with the same pains. Her curiosity, however that the day when the Sun's

surplus, and hence the spark; in the second, when I touch A, I communicate to him part of my own when the whole of the external surface of the jar the eye by a piece of colored glass. With this prowhen the whole of the external surface of the lower tection the Earth, the common reservoir of ele tricity.

When the whole of the external surface of the lower tection the San may be submitted to the elected was wet the effect was marked. He part only was wet the effect was marked. He Upon this was based his theory, which was this: suspected immediately that the hand had some is evidently to get at an estimate of its brightness all bodies are endowed with a certain quantity of thing to do with the result, and began to consider if we wish to obtain an estimate of its brightness about the control of th electricity; if they have more than their natural quantity they are electricity; if they have more than their natural quantity they are electrified positively; if less, negatively. This famous theory of a single fluid, called the Franklinian theory, was almost universally received in England and the United States; but it never obtained general acceptation on the suit is never obtained general acceptation on the suit as a conductor. He first to an observer at the Sun, we may suppose the whole heavens to be an immense Sun—from the zenith to the horizon covered entirely with the solid that the effect was increased in proportion to the light would then be equal to the light of the Sun to a person placed on its surface. The light would then be equal to the beautiful the proportion of the sun to obtain an estimate of its brightness to an observer at the Sun, we may suppose the whole heavens to be an immense Sun—from the zenith to the horizon covered entirely with the solid that the effect was increased in proportion to the location of the sun to a proportion to the beautiful the zenith to the horizon covered entirely with the solid that the effect was increased in proportion to the beautiful the zenith to the horizon covered entirely with the solid that the

And still greater will be our admiration Dr. Largerer here announced that for lack of Now we know when we consider that it was not the product of a time he should postpone the conclusion of the sub-

none more familiar and about which there is vet from all scientific cursuits, to matters of business. ance, if I must use an unpleasing term, is by no their centre at the rate of about a thousand miles His was one of those original minds. even by philosophers. You are all familiar with the observation of persons but little versed in Astronohe Sun during the winter months; and as the disimpar - more heat in winter than in summer. hemisphere. This subject was not investigated more heat imparted in winter than in summer lightly painful sensation. It occurred to Mus- This fact remained anexplained until 1830, so that the Sun will impart more heat during the former han the latter space. But it must be boare in minutes creaty, and manage to in- that the Earth takes a shorter time in passing tate it, they might then accomplish their object. around its Winter than its Summer circuit; and Sun, still the number of days is less; the quantic given during one segment will be greater than dur

in passing is greater.

Poisson, by an ingenious mathematical analysis, This was all just and philoso- showed that these two influences compensate each

Now the real source of greater heat during the than from any pain he ever before experienced; summer arises, not from any change in the distance, and he declared that for the whole kingdom of but from this; that the rays fall more perpendicuas even thrown into convulsions, and nothing other. If the rays of light be supposed to fall upon a board placed obliquely to th The astonishment which filled all Europe when face will receive only a portion of the rays; while this was published was unqualified. Philosophers if it be placed in a direction perpendicular to that are will receive only a portion of the rays; wh hardly duied to repeat the experiment, but gradu- of the rays, it will receive the whole. The same should lose the use of his arms; he was fail nearly perpendicular upon the surface; in wir seized with convutsions and a violent bleeding at ter the pole is turned away, and the rays fall

he suffered in the same manner. With a mixture in summer than in winter. There is one other of the curiosity of her sex and the courage of ours, point of some interest in a popular explanation of Thus we have as a starting-point these facts, that there are two fluids of so attenuated, so volatile, so spiritual a character, that they have no weight, nor can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking can they be perceived in any way but by taking light and hear, have a greater facility of moving over certain bodies than the analytic of moving over certain bodies that the star and the unagination. These each they have no attenuated, and raised Franking to the horizon day. It perpendicular upon may highly they passessed would allow they carried in along under a long gallery, supporting it by silkent hey passessed would allow they carried in along under a long gallery, supporting it by silkent hey passessed would allow they carried in along under a long gallery, supporting it by silkent hey passessed would allow they carried in the facts, that they passessed would allow they carried in the facts, that they passessed would allow they carried in the facts, that they passessed would allow they carried at first but afterwards were not appreciated at first but afterwards were highly estimated, and raised Franking to the butter of ner fears, and she results. We know that the cause of these soff-rings was nothing the personal light and to make it is a first and proximity to the butter of ner fears, and she results. We know that the cause of these soff-rings was nothing the butter of ner fears, and she results. We know that the cause of these soff-rings was nothing the butter of ner fears, and she results. We metal; and on rubbing the glass, and presenting light abstances to the ball, they foams that they jumped up to it, as you all know would be the case. They were, of course, lightly pleased with the result, and proceeded to carry the experiment series of the self-th of the case. They were, of course, lightly pleased with the result, and proceeded to carry the experiment series of the self-th of the case. They were of course of any creat and important truth, and they result of the contrast of the self-th of the contrast of the self-th of the court was tought with will be stronger and there, and therefore less takely to carry off our find than the Sik. Where they accordingly did take, and or rubbing the glass, and applying light bolies to the ball, found to their care as upprass, that the court was too long, and accordingly that the cord was too long, and accordingly the court will be cord was too long, and accordingly the court will be cord was too long, and accordingly the court will be cord was too long, and accordingly the court will be cord was too long, and accordingly the court will be cord was too long, and accordingly the court will be cord was too long, and accordingly the court was too long, and accordingly the court was too long, and accordingly the court was too long, and accordingly the pass of vicinities and the court was too long, and accordingly the court was too long, and accordingly the pass of vicinities and the court was too long, and accordingly the pass of vicinities and the court was too long and accordingly the pass of vicinities and the court was too long, and accordingly the pass of vicinities and the court was too long, and accordingly the conservation of the least of the vicinity and th week. The theory deserves notice not mainly on its own account, but because of the extreme beauty of the reasoning and experiments on which it was based. One of the first experiments was this two persons, A and B, stood upon two insulated stools: in the hands of A was placed a glass take, which was electrified by attrition. B then touched the tube and received a portion of the electricity. The glass will not allow them to combine it stands like a sentimely will rush together. Now Muschenbroeck held the ourside in one hand and touched the wire with the outside conting is charged with negative and the acquisition during the day; and after the nights will became longer and the days gradually sharply the solid part of the instant his a sentiment with positive electricity. The glass will the might became longer and the days gradually sharply to the old of the instant his a sentiment with positive electricity. The glass will the inghts will be a sentiment with positive electricity. The glass will the inghts will be a sentiment with positive electricity. The glass will the inghts will be a sentiment with positive electricity. The glass will the inghts will became longer and the days gradually sharply to expect the proposed during the day, and differ the nights will be a might became longer and the days gradually sharply sharply the right would come to pass, that the heat lost during the days mad then the index of the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass will the instant his a sentiment with positive electricity. The glass the night would care the night would care to pass the instant his as entiment with positive electricity. The glass the night would

discovered chiefly along the horizontal diameter of the Sun, and never more than thirty degrees above or below it. If they be watched from day to day, they will be seen to shift their positions, di-appearng on one side and re-appearing on the other .-Thus we know that the Sun revolves on its axis. and its time is known to be twenty-five and a bail of our days. A careful examination of these spots shows their

variable character. We shall find that they diirely disappear; others come in their places; and thus they come and go, augmenting and diminishdiameter of the Sun, we can easily calculate the I them cover a surface four or five times as great serve here that these spots are easily seen by ordinary telescopes; all that is necessary to guard the sight is to interpose between the eve and eye-glass colored or smeked glass. The number of spots to be seen varies gre

different times, the surface of the Sun being som times largely covered. The most remarkab when it is recorded that for fourteen m a perpetual twilight, by tesson of the spots on its surface. In 626, it is recorded that the Sin was half covered. In 1779, and again in 1795, immense spots of from 60,000 to 70,000 miles across were discovered. On the 28th of August, 1805, a black spot on the Sun's surface. It is found that in disappearing, the edges of the spots approach

Now the questions of most interest connected with this subject are, what is the physical constitution of the Son, and what causes the special Son, veral suppositions have been advanced. LAPLACE supposed that the surface of the Sun is covered with volcanoes, and that the solar light is nothing out the splendor of these volcame fires thrown to and that the spots are Craters. Sr WILLIAM HERSCHELL advanced a theory, the reall of more careful study, and based more upon acts than speculalise, which, moreover, is now rally received. Her-chell supposed the Sun o be an opaque, non-luminous globe, giving of itnosphere of flame which floats upon it as the cean or air upon the Earth. If we supp amosphere to be flaming fire surrounding the Earth, it will represent what Herschell supposed he atmosphere of the Sun to be. He accounts for he spots by supposing them to be the naked ground of the Sun, seen through openings or cavities in he atmosphere, having sides sloping downwards. Their disappearance, he believed, was caused by he flowing in upon them of the fiery ocean by which they were surrounded. Accurate observa-

If we suppose the spots to be hollows and the dge a shelving surface, when it comes to the edge of the Sun, by reason of its convexity, the eye is birected along the surface so that the penumbra on ne inner edge will in artistical language be fore This is the fact as may be determined observation. When it comes to the edge it will sappear. But we have a still more decisive proof se are hollows. When they come to the dge of the Sun they are seen sideways, of course, is the projection of light conceals the bottom.— They must then disappear as is actually the case. The assertion of Herschell then, that they are cavies acquires the character of a demonstration

It is not necessary to assume, although these pots appear black when seen through a telescope nat they are really non-luminous. The Eye judges y contrast. If we behold a very luminous object and near it another considerably less brilliant, the atter may appear almost opaque in comparison. re is a light which has been called the oxy-hydroen light, composed of a ball of quicksilver exc a flame by the oxygen and hydrogen gases. This all when heated as much as it is possible for na and bodies to be, becomes so luminous that theeye anno I car to look upon it. Such lights are often ised as signals in great surveys and I have known cease in which one of them on the top of a mounain 40 miles distant was distinctly visible, although he mountain was enveloped in mist. Now mark his; this ball of fire—so very luminous—has been held between the Eye and the Sun so as to be seen projected on the Sun's disc and when so seen it oppeared intensely black. Not that there was ny change in its absolute splendor, but the Eye intrasting it with the greater splendor of the un, the reting became insensible to that which efore it could not behild without pain. onvince us that these Solar Spots which appear lark to us may in reality be as bright as this sydrogen light.

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Philips Phoenix,
John Morrson,
Jaseph B, Varnum,
Davi I Lee,
Caleb O, Halsted,
William W, Tedd,
G, Thompson,

Najsk Pavies.
Cornelius W. Lawrence,
J. Phittips Phoenix,
John Morson.
Joseph B. Varnum,
Jovi Lee,
Caleb O. Helated,
William W. Todd,
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188. FUELONG, (Successor to A. J. Engel,
formerly A. A. Mett), respectfully informs have
records and the public generally, that she will open on the
25th inst. a large assortment of Caps, Head Dresses, Tarsus, and where the public will receive the most assisfa-

Mrs. N. F. avails herself of this opportunity of thanking ne public for the very ext asive patronage she has re-erved since her commencing in 1819, and begs to assure tem of her renewed exertions to merit their support.

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